

ON THE CARENIDES (FAM. CARABIDÆ).

No. IV.

BY THOMAS G. SLOANE.

In this paper are included some new species sent to me for description by Mr. C. French, of Melbourne (the types being in his possession); also a synoptic table of the groups of species into which the Genus *Carenum* may be divided, with some notes on synonymy, &c.

Genus LACCOPTERUM.

LACCOPTERUM HUMERALIS, n.sp.

Elongate-oval; prothorax lobate, lobe wide and roundly truncate; elytra with base deeply emarginate, humeral angles prominent, a longitudinal row of three or four large foveiform punctures along middle of each elytron; anterior tibiæ tridentate. Black, nitid, with subviolaceous tints at basal foveæ of prothorax and on inflexed margin of elytra.

Head subquadrate (2.5×4 mm.), convex, transversely impressed behind frontal spaces, these convex; frontal sulci deep, parallel; clypeus with median part truncate, intermediate angles short, triangular; eyes not prominent; two supraorbital punctures on each side. Prothorax lightly transverse (3.3×4.3 mm.), convex, parallel on sides, widely rounded at posterior angles, strongly sinuate on each side of basal lobe; anterior margin truncate with angles shortly but decidedly advanced; border reflexed, a little wider behind posterior angles; marginal

channel narrow on sides, tripunctate; basal area defined by a strong curved transverse line; a well marked rotundate foveiform impression at each basal sinuosity; median line strongly impressed. Elytra truncate-oval (8×4.3 mm.), narrowed to base, roundly and abruptly declivous on sides, deeply and abruptly declivous at apex; suture deeply impressed; humeral angles upturned in a strong short obtuse prominence; border reflexed; margin wide on apical curve; four punctures on base of each elytron near humeral angle; a closely placed row of punctures along margin; anterior discoidal puncture near basal fourth, about equidistant between humeral angle and second puncture, two posterior punctures not far apart near apical third; inflexed margin wide, narrowed posteriorly, vertical at apex. Length 15.5, breadth 4.3 mm.

Hab.—North-West Australia, between Port Darwin and the Lennard River (Coll. French).

The only previously described species to which *L. humeralis* seems closely allied is *Carenium multiimpressum*, Casteln., with the description of which it agrees generally, except in regard to the large punctures of the disc of the elytra. Castelnau, in his description of the elytra of *C. multiimpressum*, says, "they present on the middle of their breadth a longitudinal series of five large and very deep rounded impressions; these impressions do not appear to be very regular, my specimen having on one of its elytra two other similar on the posterior part, placed between these and the sutura." It is possible that *C. multiimpressum* may be a species that is variable in this respect, but, till this is found to be the case, it has seemed to me better to assign a new name to the present species rather than to place it under *C. multiimpressum*, from the description of which it certainly differs, at least, in the discoidal punctures of the elytra. In addition to the large discoidal foveæ of the elytra, there are, in the specimen before me, seven rows of fine punctures which seem a *post mortem* effect often found in naturally smooth Careniums that have been immersed in alcohol for a lengthened period.

Genus *CARENUM*.

Seven years ago I attempted to arrange the species of the central genus *Carenum* into groups as an aid in the identification of species, at the same time enumerating the species that I believed to belong to each group.* Further knowledge shows me that the system of groups then adopted was faulty, and that a number of species were referred to groups which were not their natural place. I now offer a new arrangement of the species into groups, following the lines of my former classification, but presenting alterations where such have been necessary to bring the tabulation more into accord with what seems to me a natural system, the chief alteration being the removal of the *C. anthracinum* group from Division "ii." to Division "i."

The plan of using the names of species for distinguishing groups of species in large genera seems to me decidedly better than using numbers. It allows for the interpolation of new groups in their natural position, if required, without altering the designation of every subsequent group, as would be necessary with a numeral system; it also permits of a different arrangement of the groups without causing any confusion if subsequent research shows that the first order adopted is not the most natural; in the case of numbered groups a rearrangement may alter the number of several of the groups, with the result that all subsequent references must state which system of groups is meant. The species first described should always be used as the name-species of a group.

Table of Groups in the Genus Carenum.

- I. Penultimate joint of labial palpi not swollen towards apex (usually narrow and longer than apical joint). Suborbital antennal scrobes straight, single. Inflexed margin of elytra wide behind first ventral segment.

* P.L.S.N.S.W. 1893, viii. (2), pp. 462-465.

- A. Reflexed border of elytra extending past humeral angle on to base, narrowly reflexed and not forming a thickened projection at shoulder..... C. brevicolle Group.
- AA. Reflexed border of elytra ending at humeral angle and forming a thickened upturned humeral projection.
- B. Elytra impunctate.
- C. Anterior tibiæ tridentate.
 - d. Prothorax with posterior angles prominent and strongly marked..... C. transversicolle Group.
 - dd. Prothorax with posterior angles rounded..... C. Macleayi Group.
- CC. Anterior tibiæ bidentate.
 - e. Prothorax with posterior angles prominent, subrectangular..... C. reflexum Group.
 - æe. Prothorax with posterior angles rounded, not marked.
 - f. Prothorax without a basal lobe.... C. lævipenne Group.
 - ff. Prothorax with base widely lobate in middle, a strong sinuosity on each side of lobe, angles of lobe prominent..... C. perplexum Group.
- BB. Elytra bipunctate.
 - g. Prothorax with posterior angles prominent and strongly marked; the posterior marginal punctures placed on the widely reflexed border at posterior angles; anterior tibiæ pluridentate.... C. rectangulare Group.
 - gg. Prothorax with posterior angles usually rounded; posterior marginal punctures placed in lateral channel at posterior angles.
- H. Anterior tibiæ tridentate.
 - i. Head not longitudinally impressed on each side of occiput behind eyes C. smaragdulum Group.
 - ii. Head with a longitudinal supra-orbital sulcus behind each eye. C. subcyaneum Group.
- HH. Anterior tibiæ bidentate.
- J. Elytra bipunctate.

- k.* Head with a longitudinal supraorbital sulcus behind each eye..... *C. planipenne* Group.
- kk.* Head not longitudinally impressed on each side of occiput behind eyes..... *C. marginatum* Group.
- JJ.* Elytra quadripunctate.... *C. anthracinum* Group.
- II. Penultimate joint of labial palpi short, thick, swollen. Suborbital antennal scrobes divided longitudinally in middle by an oblique ridge. Inflexed margin of elytra narrow behind first ventral segment.
- L.* Inflexed margin of elytra becoming gradually narrowed to apex. (Elytra quadripunctate) *C. bonellii* Group.
- LL.* Inflexed margin of elytra very narrow behind first ventral segment. (Facies elongate.)
- m.* Elytra quadripunctate.
- n.* Frontal sulci hardly diverging backwards..... *C. scaritioides* Group.
- nn.* Frontal sulci deep and diverging strongly backwards..... *C. 4-punctatum* Group.
- mm.* Elytra bipunctate on apical third..... *C. subplanatum* Group.

The following is a list of species of the genus *Carenum* arranged in groups according to the table given above. In my list of seven years ago a number of species that were unknown to me in nature were placed in wrong groups; therefore, in order that any such errors in the present list may cause as little confusion and trouble as possible, I have printed the names of all species definitely known to me in Roman letters, and have used italics for those species that are not at present known to me in nature. I now only assume responsibility for the accuracy of position of those species printed in Roman letters, though I have endeavoured to place the others in their proper places as far as descriptions will allow.* Species of which the position seems doubtful are referred to in notes after the list.

* It may be noted that although I may know a species in nature, it should not be assumed that I, in every case, recognise its validity as a species, for I believe there is some synonymy yet to be dealt with, but it is a matter only to be treated of when one's knowledge is sufficient.

C. brevicolle Group.*C. brevicolle*, Sl.**C. transversicollis Group.***C. frenchi*, Sl.*C. occidentalis*, Sl.*C. transversicollis*, Ch.**C. macleayi Group.***C. macleayi*, Blkb**C. reflexum Group.***C. reflexum*, Sl.**C. lævipennis Group.***C. cordipennis*, Sl.*C. ineditum*, Macl.*C. lævipennis*, Macl.*C. politum*, Westw.**C. perplexum Group.***C. perplexum*, Westw.**C. rectangulare Group.***C. rectangulare*, Macl.*C. tibialis*, Sl.**C. smaragdulum Group.***C. breviforme*, Bates.*C. cognatum*, Sl.*C. coruscum*, Macl.*C. cupreomarginatum*, Blkb.*C. dispar*, Macl.*C. distinctum*, Macl.*C. elegans*, Macl.*C. emarginatum*, Sl.*C. froggatti*, Sl.*C. habile*, Sl.*C. habitans*, Sl.*C. interioris*, Sl.*C. iridescens*, Sl.*C. lepidum*, Sl.*C. lobatum*, Sl.*C. nickleri*, Ancey.*C. odewahnii*, Cast.*C. optimum*, Sl.*C. opulens*, Sl.*C. ovale*, Sl.*C. porphyreum*, Bates.*C. rufipes*, Macl.*C. serratipes*, Sl.*C. smaragdulum*, Westw.*C. speciosum*, Sl.*C. splendens*, Cast.*C. tumidipes*, Sl.*C. virescens*, Sl.**C. subcaneum Group.***C. rugatum*, Blkb.*C. subcaneum*, Macl.*C. sulcaticeps*, Sl.**C. planipennis Group.***C. planipennis*, Macl.*C. purpureum*, Sl.*C. vicinum*, Sl.**C. marginatum Group.***C. amplicollis*, Sl.*C. convexum*, Ch.*C. decorum*, Sl.*C. fugitivum*, Blkb.*C. ianthinum*, Macl.*C. imitator*, Sl.*C. kingi*, Macl.*C. lævigatum*, Macl.*C. laterale*, Macl.*C. marginatum*, Boisd.*C. murrumbidgeense*, Macl.*C. propinquum*, Macl.*C. puncticollis*, Macl.*C. subporcatulum*, Macl.*C. subcostatum*, Macl.*C. terræ-reginæ*, Macl.*C. versicolor*, Sl.*C. viridimarginatum*, Macl.

C. anthracinum Group.

- C. anthracinum*, Macl.
C. inconspicuum, Blkb.
C. interruptum, Macl.
C. obsoletum, Macl.
C. opacicolle, Sl.

C. bonellii Group.

- C. affine*, Macl.
C. bonellii, Westw.
C. brisbanense, Macl.
C. chaulioides, Macl.
C. coracinum, Macl.
C. opacum, Macl.
C. ovipenne, Macl.
C. simile, Macl.
C. submetallicum, Macl.
C. triste, Macl.

C. scaritioides Group.

- C. scaritioides*, Westw.

C. quadripunctatum Group.

- C. acutipes*, Sl.
C. angustipenne, Macl.
C. lucidum, Macl.
C. pulchrum, Sl.
C. quadripunctatum, Macl.
C. regulare, Sl.
C. sumptuosum, Westw.
C. viridissimum, Macl.

C. subplanatum Group.

- C. batesi*, Masters.
C. felix, Sl.
C. subplanatum, Bates.
C. venustum, Sl.

The following species have been omitted from the list given above, because no specimen has been available for reference, or their positions have seemed doubtful :—

C. pusillum, Macl., requires a separate group (*vide post*).

C. parvulum, Macl., and *C. de visii*, Macl.—For notes on these species *vide* P.L.S.N.S.W. 1893, (2), viii. p. 466.

Calliscapterus foveolatus, Macl., and *C. viridieneus*, Macl., evidently might be placed in the *C. smaragdulum* Group, but as I have tabulated the species of that group (*vide post*), and am unable to indicate their position in the group, I have preferred to omit them till I am able to examine the types.

Carenum carbonarium, Cast., seems to me likely to belong to the *C. planipenne* Group (*vide* P.L.S.N.S.W. 1897, xxii. p. 206).

C. cyanipenne, Macl., and *C. gracile*, Sl., are probably only varieties of *C. anthracinum*, Macl., (*vide post*).

C. striato-punctatum, Macl., has no affinity to *C. marginatum* and its allies. I have seen the type, but have not examined it critically, so do not feel able to suggest its natural place in *Carenum*.

C. devastator, Cast., the largest species of *Carenum*, is unknown to me in nature. The description seems that of a species which should be placed in my Division "ii.," and leads me to suppose that it is a species with the prothorax of *Carenidium*, and elytra resembling those of *C. regulare*. No mention is made of the anterior tibiæ, but I should expect them to be bidentate.

C. nitescens, Macl., is unknown to me in nature, but the description gives ample evidence that it is not allied to *C. marginatum*. The elongate shape of the elytra indicates that their inflexed margins will prove to be narrow, and suggests that its place is near to *C. subplanatum*.

CARENUM PUSILLUM, Macl.

A careful examination of specimens sent to me by Mr. French labelled "Cape York," which I identify as *C. pusillum*, Macl., shows this to be an isolated species which cannot be placed in any of the groups into which I have divided *Carenum*; its affinity seems rather towards *Laccopterum cyaneum*, Fabr., (also a species of doubtful position), than to any other described species. It requires a separate group, but as I am not prepared to suggest its relative position towards the other groups, it has not been worked into my table. The following description gives some features not alluded to in the original description:—

Head resembling that of *Laccopterum cyaneum*, Fabr., but the eyes much more convex; labrum truncate; suborbital antennal scrobes single, short, wide; penultimate joint of labial palpi stout, not swollen, shorter than apical joint; this as in *L. cyaneum*—not nearly so widely securiform as in *C. quadripunctatum*, *C. bonellii*, or *Eutoma*. Prothorax transverse, truncate at apex (anterior angles not advanced), rounded on sides and at posterior angles, widely sublobate in middle of base, tripunctate in lateral channels, narrowly bordered. Elytra suboval, widest before middle, rounded on sides, quadripunctate; base truncate, quadripunctate on each side; border narrow (not thick as in *Eutoma*), thickened and shortly upturned at humeral angles; inflexed margins of medium width, becoming narrower to apex. Anterior tibiæ strongly

bidentate with a small projection just above base of second tooth. Upper surface cyaneous. Length 8·5, breadth 2·9 mm.

CARENUM RECTANGULARE, MacI.

Specimens of *C. rectangulare*, MacI., have been sent to me by Mr. French as having been found between Alice Springs and Charlotte Waters, Central Australia. These specimens I have compared with the types of *C. rectangulare*, MacI., with which they proved conspecific. They are intermediate between the typical forms of *C. rectangulare* and *C. tibiale*, Sl., and indicate that *C. tibiale* should probably be placed under *C. rectangulare* as a variety—the only differences being the less truncate base of the prothorax and the more cordiform elytra of *C. tibiale*. The colour of *C. rectangulare* is variable, one of Mr. French's specimens having the elytra of a rich purple colour narrowly margined with greenish-blue, and the prothorax purple near the sides, with the margin coloured like that of the elytra.

Table of Species of the C. smaragdulum Group.

- A. Head with one supraorbital puncture, prothorax with two marginal punctures on each side.*
- B. Prothorax with posterior angles strongly marked.
 - c. Elytra with shoulders prominent, the base emarginate between them..... *C. emarginatum*, Sl.
 - cc. Elytra with shoulders rounded, the base hardly emarginate..... *C. interioris*, Sl.
- BB. Prothorax with posterior angles rounded.
 - D. Prosternum with intercoxal part widely longitudinally channelled, truncate at base.
 - e. Anterior angles of prothorax strongly advanced.
 - f. Border of elytra hardly folded over at humeral angles—not raised or prominent (intermediate tibiae with a short external spur at apex)..... *C. ovale*, Sl.

* Excepting *C. tumidipes*, Sl., which has three marginal punctures on each side.

- ff.* Border of elytra decidedly thickened at humeral angles and forming a raised prominence.
- G. Anterior femora not swollen in middle of lower side.
- * *h.* Suborbital antennal scrobe long, its lower edge forming a ridge.
- i.* Frontal sulci short, parallel.
- j.* Prothorax without a well-defined basal area.
- k.* Prothorax and elytra with { *C. cupreomarginatum*, Blkb.
cupreous margins..... } *C. opulens*, Sl.
- kk.* Prothorax and elytra purple-black, with greenish margins..... *C. dispar*, MacL.
- jj.* Prothorax strongly lobate behind and with well-defined basal area..... *C. virescens*, Sl.
- ii.* Frontal sulci divergent..... *C. froggatti*, Sl.
- hh.* Suborbital antennal scrobe short, lower side not forming a ridge. (Posterior tarsi with basal joint short—shorter than two succeeding joints together).
- l.* Prothorax and elytra with wide green margins (form short)..... *C. breviforme*, Bates.
- ll.* Prothorax and elytra with purple margins.
- m.* Frontal sulci short, parallel..... *C. lobatum*, Sl.
- mm.* Frontal sulci diverging lightly backwards—deep posteriorly..... *C. serratipes*, Sl.
- GG. Anterior femora swollen in middle of lower side. (Frontal sulci diverging strongly backwards).
- n.* Posterior tibiæ thick, prothorax with two marginal punctures on each side..... *C. habitans*, Sl.

- nn.* Posterior tibiæ light, prothorax with three marginal punctures on each side..... *C. tumidipes*, Sl.
- ee.* Anterior angles of prothorax very little advanced (not prominent)..... *C. iridescens*, Sl.
- DD.* Prosternum with intercoxal part obliquely rounded at base, the middle forming a subtuberculiform prominence. (Prothorax and elytra with cupreous margins) *C. lepidum*, Sl.
- AA.* Head with two supraorbital punctures, prothorax with three marginal punctures on each side. (Frontal sulci strongly divergent backwards).
- o.* Posterior tibiæ thick, incrassate..... { *C. odewahni*, Cast.
C. speciosum, Sl.
- oo.* Posterior tibiæ slender.
- p.* Prothorax with marginal channel and reflexed border wide { *C. elegans*, Mael.
C. splendens, Cast.
C. rufipes, Mael.
C. cognatum, Sl.
C. optimum, Sl.
- pp.* Prothorax with marginal channel and reflexed border narrow..... *C. distinctum*, Mael.

I offer the following notes on some species of the *C. smaragdulum* Group, including the species I have omitted from the table given above:—

C. porphyreum, Bates, is evidently closely allied to *C. cupreo-marginatum*, Blkb., and *C. opulens*, Sl., but should be readily distinguishable from them by the green margins of the prothorax and elytra. It is described as having the prothorax with “the hind margin not lobed and distinctly trisinate.”

C. smaragdulum, Westw., must present an affinity to *C. virescens*, Sl. Its shining green colour distinguishes it from allied described species excepting *C. virescens*; however, from Westwood's figure the humeral angles of the elytra seem more rounded with the border less erect than in *C. virescens*. I believe, judging from Westwood's figure, that *C. smaragdulum* resembles *C. habile*, Sl., in facies.

C. habile, Sl., (type destroyed), appears to be closely allied to *C. smaragdulum*, Westw., from which only the colour seems to readily differentiate it.

C. coruscum, Macl., is unknown to me in nature. Sir William Macleay apparently regarded it as allied to *C. elegans*, Macl.

C. splendens, Casteln., is closely allied to *C. elegans*, Macl.; *C. cognatum*, Sl., is a form connecting them. It seems to me probable that with further knowledge these three forms will be united under *C. elegans*, but more data than I possess are necessary for a confident opinion on the subject.

C. rufipes, Macl.—I have examined the type of *C. rufipes* in the collection of the Australian Museum, Sydney; it is an immature specimen with slender posterior tibiæ. A specimen from Norseman, S.W. Australia, has been given to me by Mr. C. French, and a comparison with the type of *C. rufipes* shows it to be that species. This Norseman specimen only seems to differ from *C. elegans*, Macl., by having the elytra wholly of a steel-blue colour; to me it seems conspecific with *C. elegans*, but might, perhaps, be regarded as the south-western form of that species and given rank as a variety.

C. optimum, Sl.—This form, from the Murchison District of Western Australia, seems to be the north-western representative of *C. elegans*, Macl.; further knowledge may show it to be a variety of that species.

C. speciosum, Sl., has thick incrassate posterior tibiæ like *C. odewahnii*, Casteln., of which species it is the north-western representative, and from which it only seems to differ by its brightly coloured steel-blue elytra. I hardly think it can be maintained as distinct from *C. odewahnii*.

CARENUM EMARGINATUM, n.sp.

Oblong-oval, rather depressed, lavigate; prothorax widely transverse, posterior angles widely reflexed and strongly marked, base lobate; elytra bipunctate posteriorly, emarginate at base, humeral angles strongly marked; anterior tibiæ tridentate.

Black, shining; elytra dark purple, brighter towards sides, marginal channel greenish-blue; lateral channel of prothorax of a bluish tinge.

Head smooth, subquadrate (3.5×5.2 mm.), convex across occiput; front depressed; facial sulci short, lightly divergent posteriorly; median frontal space not divided from occiput; lateral frontal spaces abruptly declivous externally, lightly raised at base above sides of occiput; clypeus with median part truncate, intermediate angles obtusely dentiform, narrow at base and projecting sharply from margin of head on outer side; preocular sulcus distinct, short; preocular process narrow, convex on outer edge; eyes depressed; one supraorbital puncture on each side. Antennae setaceous, lightly compressed. Prothorax transverse (4.3×6.8 mm.), wider between anterior than between posterior angles; sides lightly rounded; anterior angles shortly advanced, widely obtuse; posterior angles rounded, not marked; base shortly lobate, obliquely truncate towards sides; basal lobe wide, rounded; sinuosity on each side of base wide; border reflexed, wide on sides, very widely reflexed at posterior angles, narrower on basal lobe; marginal channel wide; median line strongly impressed; two marginal punctures on each side. Elytra a little wider than prothorax (10.5×7.1 mm.), rather depressed; sides lightly rounded, widening very gently behind shoulders; base emarginate, strongly (not roundly) declivous; humeral angles prominent; border reflexed, reaching peduncle, strongly upturned and prominent (not dentiform) at humeral angles; margin wide, especially on apical curve; a catenulate series of evenly placed fine punctures along sides; three punctures on each side of basal declivity. Prosternum with intercoxal part longitudinally impressed, base truncate and unpunctate at each angle. Posterior legs light, posterior coxae impunctate. Length 20, breadth 7.1 mm.

Hab.—Nickol Bay, W.A. (Coll. French).

A very distinct species; it differs from *C. interioris*, Sl., by the elytra being longer, less strongly rounded on sides, and with pro-

minent humeral angles. The posterior marginal puncture of the prothorax is placed a little before the posterior angle, which is an unusual position in *Carenum*.

CARENUM OVALE, n.sp.

Elliptical-oval, robust, convex, lævigata; head large, with parallel frontal sulci; prothorax transverse, posterior angles rounded; elytra oval, bipunctate posteriorly, humeral angles not marked; anterior tibiæ tridentate. Black, prothorax and elytra with narrow violaceous margins.

Head transversely subquadrate (4.6×6.8 mm.), convex; frontal sulci short, parallel; clypeus lightly declivous to labrum, median part wide, truncate, intermediate angles short, obtuse; eyes convex. Prothorax transverse (5×8.5 mm.), convex; sides lightly rounded, subparallel in middle, rounded at posterior angles; basal curve short, lightly bisinuate; anterior margin truncate between anterior angles—these shortly advanced, obtuse; border thick, reflexed, more widely upturned at posterior angles; two marginal punctures on each side. Elytra oval (12.6×9.2 mm.), convex, roundly declivous to humeral angles; sides evenly rounded; base roundly truncate; humeral angles rounded; border reflexed, hardly folded over (not thickened or upturned) at humeral angles; marginal channel wide; five or six punctures in two rows near humeral angles; the punctures along margin small and closely placed. Prosternum not bordered along anterior margin; intercoxal part widely channelled, truncate at base with two or three punctures on each side. Legs stout; intermediate tibiæ thick, incrassate, spinose, a fine tooth at apex externally. Length 24, breadth 9.2 mm.

Hab.—Queensland: Winton District (Coll. French).

Allied to *C. dispar*, MacL., from which it is readily identified by colour; more convex shape; the elytra with base not wide and truncate, and with shoulders rounded, the border not thickened and folded back at humeral angles; the base of the prothorax less strongly lobate, &c. It is readily differentiated from *C. interioris*,

Sl., by its more convex head, with shorter and more parallel frontal sulci; prothorax with posterior angles not marked; elytra more rounded at humeral angles, and with the base not so wide or truncate.

CARENUM LOBATUM, n.sp.

Elliptical-oval, lævigata; frontal sulci parallel; prothorax short, transverse; elytra oval, bipunctate towards apex, humeral angles a little upturned, not prominent; anterior tibiæ tridentate. Black, nitid, elytra and prothorax slightly violaceous towards sides.

Head subquadrate (3.7×5.4 mm.), convex behind eyes; front and clypeus sloping gently forward to anterior margin; clypeus with median part truncate, intermediate angles short, triangular, obtuse; preocular sulcus well marked; preocular process small, narrow; eyes depressed, strongly enclosed posteriorly; one supra-orbital puncture on each side. Prothorax transverse (4×7 mm.); sides subparallel in middle, widely and evenly rounded at posterior angles; apex emarginate; anterior angles lightly advanced, rounded; basal lobe well developed, rounded; border reflexed, more strongly so at posterior angles; two marginal punctures on each side; basal area defined by a transverse impression; a short light impression near each basal sinuosity. Elytra oval (10.5×7.3 mm.); sides evenly rounded; base truncate between humeral angles, strongly declivous to peduncle; punctures of basal declivity in two transverse rows (three in each row) on each elytron; punctures of lateral channel closely placed; border reflexed, a little thickened and turned over at humeral angles. Prosternum not bordered on anterior margin; intercoxal part truncate at base, bipunctate on each side. Legs light, posterior tarsi with basal joint about as long as (not longer than) two succeeding joints together. Length 20, breadth 7.3 mm.

Hab.—North-West Australia (Coll. French; unique).

Allied to *C. dispar*, MacI., from which it differs by colour; shorter and more lobate prothorax; more oval elytra, more narrowed to the humeral angles and less truncate on the base;

prosternum not bordered along anterior margin; basal joint of posterior tarsi shorter, &c. This species was sent to Mr. French as having been found on a journey from Port Darwin to the Lennard River near Derby.

CARENUM SERRATIPES, n.sp.

Oblong-ovate, form rather light; prothorax with anterior angles porrect, posterior angles rounded, base lobate, marginal channel wide, bipunctate; elytra oval, bipunctate on apical third; anterior tibiæ tridentate, outer edge denticulate above three large teeth. Black, shining, elytra faintly suffused with violet on lateral declivities, lateral channels of elytra and prothorax cyaneous-purple.

Head transverse (3.5×5 mm.), smooth, strongly declivous on sides, not longitudinally impressed on sides of occiput; front rather depressed; frontal sulci deep, elongate, lightly divergent posteriorly; clypeus deeply emarginate-truncate in middle, intermediate angles triangular, obtuse; preocular sulcus narrow, deep; preocular process narrow; eyes lightly convex, not prominent, deeply set in orbits; one supraorbital puncture on each side; submentum strongly raised from gulæ, divided from genæ on each side by a longitudinal sulcus. Prothorax transverse (3.7×6.2 mm.), lightly convex, declivous to base, declivous to sides (lateral declivity gentle); sides subparallel before posterior angles; anterior angles strongly advanced, widely rounded at summit; base lightly sinuate on each side of the short rounded basal lobe; border strongly reflexed, not thicker on basal lobe; marginal channel wide, narrow on basal lobe, median line strongly impressed. Elytra oval, a little wider than prothorax (9×6.5 mm.), convex; sides strongly and evenly rounded; base depressed, obliquely declivous; margin wide, especially on apical curve; border strongly reflexed, reaching peduncle, wider and folded back but not prominent or erect at humeral angles; basal declivity finely and irregularly punctate (about eight punctures); a row of closely placed umbilicate punctures along lateral margins. Prosternum

with intercoxal part channelled, truncate on base, unipunctate at each angle. Legs light; anterior femora not dilatate in middle, a row of punctures on posterior side near lower margin; anterior tibiae slender, exterior ridge with two small rather prominent teeth above three larger ones, inferior ridge serrate, apical plate with strong acute tooth projecting from apex below tarsus. Length 17.5, breadth 6.5 mm.

Hab.—Nickol Bay, W.A. (Coll. French; unique).

C. serratipes has a strong general resemblance to *C. lævigatum*, MacL., from which the tridentate anterior tibiae at once distinguish it. It is allied to *C. lobatum*, Sl., from which it differs by facies; inflexed margins of the elytra purple; frontal sulci more divergent and deeper posteriorly; prothorax with anterior angles more advanced, posterior angles more rounded, basal lobe less developed; elytra shorter and wider.

CARENUM TUMIDIPES, n.sp.

Robust, convex; head large, with one supraorbital puncture on each side, frontal sulci divergent; prothorax transverse, lobate, with three marginal punctures on each side; elytra oval, bipunctate towards apex; anterior femora swollen on lower side, anterior tibiae tridentate, posterior tibiae stout—not thick and incrassate. Head, body and legs black; prothorax black on disc, widely margined with green laterally; under parts tinged with green; elytra green—including inflexed margins.

Head transverse, subquadrate (5×7.2 mm.); frontal sulci deep, diverging strongly backwards; clypeus strongly declivous to labrum, median part wide, truncate, intermediate angles prominent, short, triangular; preocular sulcus well marked; preocular process small; eyes reniform, not prominent. Antennae filiform, stout, lightly compressed. Prothorax wide (5.3×9.2 mm.), convex, declivous to base; sides subparallel in middle; anterior angles lightly advanced, wide, obtuse; posterior angles widely rounded; base with a light wide sinuosity on each side of the rounded lobe; border strongly reflexed; basal area defined by a transverse

impression; a short wide shallow impression near each basal sinuosity. Elytra oval (12.2×8.8 mm.), lightly emarginate, obliquely declivous between humeral angles, convex, evenly rounded on sides; border thick, prominent and upturned at humeral angles; punctures of base (5 or 6) in two transverse rows (the punctures of posterior row smaller than those of anterior row). Prosternum with intercoxal part widely channelled, truncate at apex, with a single puncture at each side. Anterior tibiæ tridentate, two small prominences above larger teeth. Length 25, breadth 8.8 mm.

Hab.—North-West Australia (Colls. French and Sloane). Sent to me by Mr. French, who reports it as having been found by one of his friends on a journey from Port Darwin to the Lennard River.

Its position is between *C. habitans*, Sl., and *C. elegans*, MacL., to both of which it has affinities, and which it proves to belong to one group of species. Differences between it and *C. habitans* to which attention may be directed are, the anterior tibiæ more swollen in middle of lower side, posterior tibiæ much more slender and less incrassate to apex; the prothorax with three marginal punctures on each side. The larger and heavier head with one supraorbital puncture on each side differentiates it from *C. elegans* and allied species. The divergent frontal sulci readily separate it from *C. virescens*, Sl., and other species with short parallel frontal sulci.

CARENUM DISPAR, MacL.

Mr. French has a specimen of *C. dispar* (which I have compared with the type in the Macleay Collection) from the Mallee Districts of North-west Victoria.

CARENUM SUBCYANEUM, MacL.

I have examined the types of *C. subcyaneum*, MacL., in the Macleay Museum, and have noted the presence of an oblique supraorbital sulcus on each side of the occiput. The species noted by me as *C. sulcaticeps*, var. C. (P.L.S.N.S.W. 1897, xxii.

p. 201) seems to be *C. subcyaneum*. I think it is quite likely that further investigations with specimens from many different localities will show that *C. rugatum*, Blkb., and *C. sulcaticeps*, Sl., will have to be placed under *C. subcyaneum*, perhaps as varieties.

CARENUM SUBPORCATULUM, Macl.

C. subporcatulum, Macl., Trans. Ent. Soc. N.S.W. 1865, i. p. 184; *C. politulum*, Macl., *l.c.*, 1873, ii. p. 98.

A comparison of the types of these species in the Australian Museum convinces me of the correctness of the above synonymy.

CARENUM ANTHRACINUM, Macl.

C. anthracinum, Macl., Trans. Ent. Soc. 1864, i. p. 135; *C. ebeninum*, Casteln., Trans. Roy. Soc. Victoria, viii. p. 134.

C. ebeninum, Casteln., should, from the description, be a synonym of *C. anthracinum*, Macl.; specimens are in the Macleay Museum labelled "*C. ebeninum*, Casteln.," which are conspecific with *C. anthracinum*. Mr. Blackburn has noted the variability in colour of *C. anthracinum* (Trans. R. Soc. S. Aust. 1887, x. p. 58); specimens taken by Mr. C. French, Junr., in the Northwest of Victoria, vary in colour of the elytra from black on the disc with purple reflections on the sides to black only near the middle of the disc with the lateral declivities bright metallic purple; these specimens cannot be separated from *C. anthracinum*, and seem also (though a little larger) conspecific with *C. gracile*, Sl., which in view of their evidence cannot be regarded as more than a variety of *C. anthracinum*. I do not think *C. cyanipenne*, Macl., is a species distinct from *C. anthracinum* (*vide* Blackburn, *l.c.*)

CARENUM SCARITIOIDES, Westw.

C. scaritioides, Westw., Arcan. Ent. i. p. 192; *C. intermedium*, Westw., Trans. Ent. Soc. 1849, v. p. 203; *C. atronitens*, Macl., Trans. Ent. Soc. N.S.W. 1863, i. p. 137; *C. oblongum*, Macl., *l.c.*, p. 138; *C. nigerrimum*, Macl., *l.c.*, p. 176; *C. ambiguum*, Macl.,

l.c., p. 177; *C. subquadratum*, Macl., *l.c.*, p. 177; *C. striato-punctulatum*, Macl., *l.c.*, p. 178; *C. ignotum*, Sl., P.L.S.N.S.W. 1891, (2), vi. p. 427.

Most of the synonymy given above has already been published by me (P.L.S.N.S.W. 1897, xxii. p. 211), and I have now to add *C. ambiguum*, Macl., after examination of the type. *C. ignotum*, Sl., is, from comparison of types, conspecific with *C. ambiguum*. After seeing the type of *C. subquadratum*, Macl., I can find no decided difference, beyond its somewhat more depressed form, between it and *C. scaritioides*, Westw., of which I regard it as a synonym.

CARENUM REGULARE, n.sp.

♂. Elongate, robust, parallel; head large, deeply bisulcate, lightly constricted behind eyes; prothorax a little broader than long, subparallel on sides, obliquely angustate to base; elytra twice as long as broad, subdepressed, strongly declivous on sides and apex, quadripunctate, border thickened and upturned at humeral angles, inflexed margin very narrow behind first ventral segment; anterior tibiæ bidentate. Under surface, legs, head (generally), and disc of prothorax black, some greenish reflections on sides of occiput, below eyes and on sides of prosternum; margins of prothorax viridescent; elytra purple-black, violaceous on lateral declivities, marginal channel viridescent, inflexed margins with faint purple and greenish reflections.

Head large (5.3×6.5 mm.), convex, declivous to anterior margin; frontal sulci divergent and very deep posteriorly; frontal spaces convex, posterior margin of middle space declivous and filling all the interval between extremities of frontal sulci; clypeus with median part truncate, intermediate angles short, prominent, triangular; preocular sulcus lightly impressed, extending backwards above eyes; preocular process slightly protuberant; eyes deeply enclosed in orbits, convex, rather prominent; orbits narrow behind eyes, as prominent as eyes, sloping sharply to head; two supraorbital punctures on each side; suborbital channel divided by a strong oblique, elongate ridge; sub-

mentum and genæ very strongly and abruptly raised from gulæ. Antennæ stout; four basal joints cylindrical, six succeeding ones compressed, apical joint elongate, oval. Prothorax very little wider than head (6.6×7.5 mm.), convex, lightly declivous to base; basal area defined by a transverse impression; sides subparallel, rounded at posterior angles, hardly sinuate on each side of base; anterior margin truncate; anterior angles widely rounded and hardly at all advanced; base wide, rounded; border narrow, more strongly reflexed behind posterior angles, thick on base; lateral marginal channel narrow, not continued across base; a distinct wide shallow impression in front of each basal angle; median line linear, deep (only the anterior marginal puncture present in specimen before me). Elytra about same width as prothorax (15×7.7 mm.), very little rounded on sides; apical curve wide, short, base truncate, vertical above peduncle; disc subdepressed; sides and apex roundly and strongly declivous; border narrow, thickened towards apex (the edge not reflexed on apical curve), decidedly thickened and upturned (not dentate) at humeral angles; four ocellate punctures in a slight depression on base near each humeral angle, a fifth puncture at a little distance from these; lateral row of punctures rather widely placed, except near humeral angles. Suture between second and third ventral segments entire; second ventral segment with a shallow concave impression in middle between posterior trochanters; reflexed border of apical ventral segment not foveolate on each side of anus. Legs long; anterior femora thick, not dilatate in middle or with a notch on lower side before apex, unipunctate near lower margin of inner side towards apex; anterior tibiæ bidentate, apical plate without a dentiform projection below tarsus; intermediate tibiæ with a strong triangular external tooth at apex; posterior legs long, light, trochanters pyriform, triangular and pointed at apex. Length 27, breadth 7.7 mm.

Hab.—Barrow Creek, Central Australia (Coll. French; unique).

Closely allied to *C. acutipes*, Sl., with which it agrees in every feature of importance, but differing in colour, larger size, basal sinuities of the prothorax almost obsolete, posterior

trochanters with the apex less drawn out into an acuminate point. It seems impossible to unite the two unique specimens of *C. regulare* and *C. acutipes* before me under one specific name, though subsequent observations may show them to be varieties of a widely spread and variable species. The anterior discoidal punctures of the elytra are placed close behind the humeral angles (2 mm. distant), the posterior about the apical fifth. I have placed *C. acutipes* and *C. regulare* in the same group as *C. quadri-punctatum*, Macl., though they seem to have but little affinity to that species.

CARENUM SUBPLANATUM, Bates.

I identify as *C. subplanatum*, Bates, a species in Mr. C. French's collection, of which the following is a description:—

Head black with purple reflections near posterior extremities of frontal sulci; prothorax black, violaceous towards margins; elytra bright violaceous; under surface black. Head transverse (2.5×3.7 mm.), convex, transversely impressed across occiput; frontal sulci deep, diverging lightly backwards and meeting posterior transverse impression at full depth; frontal spaces convex, the lateral ones abruptly acclivous and bipunctate above eyes; clypeus with median part truncate, intermediate angles prominent, short, acute; eyes deeply set in orbits, not prominent or convex; suborbital channels to receive antennæ wide, short, longitudinally divided by a short, weakly developed oblique ridge. Prothorax transverse (3.2×4.2 mm.), convex, shortly lobate at base, rounded at posterior angles; apex truncate, anterior angles hardly at all advanced; border narrow: two marginal punctures on each side. Elytra oval (7.7×4.4 mm.), subdepressed, roundly declivous at sides and apex, bipunctate towards apex; base vertical above peduncle, lightly and widely impressed near each humeral angle, each of these depressions quadripunctate; border narrow, thick towards apex (as in *Eutoma*), slightly thickened and upturned at humeral angles; inflexed margins narrow, convex backwards from middle of first ventral segment. Legs as in *Eutoma*, anterior tibiæ bidentate. Length 14, breadth 4.4 mm.

Hab.—North-West Australia.

Carenum (*Paliscaphus*) *felix*, Sl., resembles *C. subplanatum*, Bates, but a specimen is not now available to me for comparison. It seems to me that *Paliscaphus*, though closely allied to *Eutoma*, cannot be united with it, and is as much entitled to generic rank; however, I prefer to merge it in *Carenum*.

Genus EUTOMA.

I offer the following grouping of the species of *Eutoma* in the hope that it may help to make the identification of species in that genus a little less difficult than at present. *Eutoma aberrans*, Sl., should be referred to *Conopterum*.

I. Elytra bipunctate.

A. A single large puncture on the base of each elytron near shoulder.

E. cavipenne, Bates.

E. gratiosum, Sl.

E. cupripenne, Macl.

E. splendidum, Macl.

E. violaceum, Macl.

AA. Several punctures in a cluster at base of each elytron.

E. adelaidæ, Blkb.

E. Mastersi, Macl.

E. episcopale, Cast.

E. purpuratum, Cast.

E. filiforme, Cast.

E. subrugosulum, Macl.

E. glaberrimum, Macl.

E. substriatulum, Macl.

E. levissime, Sl.

E. tinctillatum, Newm.

E. undulatum, Macl.

II. Elytra quadripunctate.

E. brevipenne, Macl.

E. magnificum, Macl.

E. digglesi, Macl.

E. viridicolor, Sl.

III. Elytra sex- or octopunctate.

E. frenchi, Sl.

E. punctipenne, Macl.

The *E. splendidum* Group belongs to South-West Australia, with the exception of *E. gratiosum*, Sl., which is said to be from the Mallee District of Victoria, a locality which I cannot help thinking may have been ascribed to it in error.

E. tinctillatum, Newm., seems to be the only species of the genus found east of a line drawn from Moreton Bay to Port Phillip. I have no doubt but that *E. bipunctatum*, Macl., *E. punctulatum*, Macl., *E. newmani*, Cast., *E. leve*, Cast., *E. lodd-*

nense, Cast., are synonyms of *E. tinctillatum*. I have not examined Sir William Macleay's types carefully, but have great doubt whether his species from Eastern New South Wales, viz., *E. glaberrimum*, *E. mastersi*, *E. subrugosulum*, *E. substriatulum* and *E. undulatum* are different from *E. tinctillatum*.

EUTOMA LEVISSIME, n.sp.

Elongate, subdepressed, lævigata; head wide across eyes, decidedly narrowed behind eyes; prothorax a little broader than long, widely lobate at base; elytra truncate-oval, bipunctate, base with three punctures in a depression near each angle, marginal row of punctures wide apart in middle of sides (only three or four). Polished black, prothorax narrowly margined with purple, elytra becoming purple on lateral declivities.

Head wide (2.8×3.5 mm.), transversely impressed behind vertex, frontal sulci deep, diverging posteriorly; space between sulci convex, with an oblique foveiform impression on each side at narrowest part; spaces between sulci and eyes convex, roundly prominent and convex before eyes; preocular sulcus obsolete; eyes convex, more prominent than supra-antennal plates, deeply enclosed in orbits at base; postocular processes sloping gently to head; two supraorbital punctures on each side. Prothorax a little broader than long (3.3×3.5 mm.), subdepressed, lightly declivous to base; sides subparallel in middle, lightly rounded to anterior angles, widely rounded at posterior angles, strongly narrowed behind with a decided sinuosity on each side of basal lobe; apex truncate, anterior angles not marked; border reflexed, thicker on basal lobe; median line strongly impressed; two marginal punctures on each side. Elytra oval (6.8×3.5 mm.), depressed on disc, widest about middle, a little narrowed to base; border narrow, forming a thick bead along sides, a little folded back (not dentiform) at humeral angles, reaching peduncle on base; suture strongly impressed. Anterior tibiæ bidentate. Length 13, breadth 3.5 mm.

Hab.—North Australia (Coll. French).

The legs are as usual in *Eutoma*; the frontal sulci are shallower posteriorly and do not extend as far backwards as in *E. tinctillatum*, Newm. In the specimen before me, just behind the extremity of each sulcus there is a small punctiform impression, which may represent the usual end of the sulcus in the species, and the presence of which in the type specimen may be caused by a slight interruption of the ordinary course of the sulcus.

Allied to *E. tinctillatum* but more depressed; the head wider across the eyes and more strongly narrowed posteriorly, eyes more prominent and convex; prothorax proportionately wider, less convex and less declivous to the sides (the sides are decidedly narrowed to the apex from the anterior marginal puncture); elytra shorter, the marginal punctures fewer in number and placed at wider intervals on middle of sides; posterior trochanters shorter and more oval (more widely rounded at apex). The genæ rise abruptly from the gulæ at the base, instead of by a gentle slope as in *E. tinctillatum*, and are not divided from the submentum by a sulciform impression. Its exact habitat is doubtful, but I believe it is either from Cape York or the North-west Coast.

E. PUNCTIPENNE, Macl.

Three specimens of this species have been given to me by Mr. C. French as from Cape York, Queensland. The colour is metallic-purple (including under surface), each elytron has four large punctures—wide apart—placed longitudinally along the middle (one specimen has five punctures on the right elytron). The measurements of the largest specimen are—head 2.8×3.2 mm., prothorax 3.5×3.3 mm., elytra 7×3.3 mm. Length 11.5-13.5, breadth 2.8-3.3 mm.

E. frenchi, Sl., is very closely allied to *C. punctipenne*, Macl., but seems to me specifically distinct; it differs by its green colour, the elytra with only three punctures on each, the anterior angles of the prothorax a little more prominent, &c. It should be noted that by some oversight I described *E. frenchi* as having the



elytra quadripunctate, whereas the type, which is in my possession, has three punctures on each elytron, the posterior puncture being near the apex on the apical declivity.

Genus CARENIDIUM.

CARENIDIUM SAPPHIRINUM, Bates.

A species of *Carenidium* from the North-west Coast is in the possession of Mr. C. French, which I identify as *C. sapphirinum*, Bates. The following is a brief description:—

Upper surface dark violet becoming green on sides of prothorax, elytra and head, also in the frontal sulci; under surface black with bluish metallic tints on gulæ; prosternum, inflexed margins of elytra, sides of abdomen and legs black. Head large (4.7×7 mm.), upper surface shagreened; labrum emarginate in a regular curve; clypeus sinuate-emarginate behind labrum; intermediate angles obtuse, wide at base, projecting lightly. Mandibles thick, the left with the tooth in middle thick, short, slightly elevated. Prothorax convex, transverse (6×8.7 mm.); sides rounded; border widely reflexed. Elytra oval (14×9.5 mm.), subdepressed; base abrupt behind peduncle, lightly emarginate at suture; four or five obliquely placed punctures on each side of base. Length 29, breadth 9.5 mm.

From *C. gagatinum*, MacL., and *C. superbum*, Casteln., two previously described species with impunctate elytra, the colour; the shorter elytra, strongly and evenly rounded on sides; the stout slightly upturned tooth of the left mandible, &c, help to distinguish it.

CARENIDIUM PYRIPENNE, n.sp.

♀. Robust, convex; head large, labrum and clypeus emarginate, mandibles flattened on upper surface near clypeus; prothorax transverse, base lobate; elytra pyriform; legs light, anterior tibiae bidentate. Black, prothorax and elytra cyaneous towards sides, inflexed margins of elytra and episterna of prosternum cyaneous, antennæ reddish-piceous.

Head large, convex (5.5×7 mm.); anterior margin extending outward on each side from intermediate angles of clypeus in a gentle curve without sinuosities; frontal sulci deep, diverging backwards; lateral frontal spaces abruptly acclivous above eyes; clypeus strongly declivous and deeply emarginate behind labrum, intermediate angles obtuse, not advanced; preocular sulcus shallow; preocular process small, hardly divided from frontal lateral space; eyes convex, deeply enclosed at base, orbits projecting from head in a long oblique slope behind eyes; two supraorbital punctures on each side. Prothorax transverse (6.3×8.6 mm.), convex, declivous to basal lobe; sides strongly rounded, a strong sinuosity on each side of basal lobe; apex widely emarginate; anterior angles lightly advanced, obtuse; basal area depressed, defined by a transverse line; basal lobe roundly truncate; border narrow, reflexed; two marginal punctures on each side, the anterior distant from apex; median line deeply impressed. Elytra convex, wider than prothorax (15.5×9.5 mm.), widest before middle, gradually and roundly angustate to apex; sides strongly rounded to base, humeral angles not marked; base abrupt, truncate in a lightly emarginate curve; border narrow; inflexed margins wide; four fine punctures on base of each elytron (not placed obliquely in a depression), lateral punctures as usual in the genus. Prosternum with intercoxal part raised above the plane of the pectoral part and lightly canaliculate. Length 29-32, breadth 9.5-10.2 mm.

Hab.—Shark's Bay, W.A. (the type; Coll. French); N.W. Coast (a second specimen, kindly given to me by Mr. French, which is also the ♀, and has the elytra less ampliate behind the shoulders than the type).

The conspicuous character of this species is the pyriform shape of the elytra, which are widest about the basal third and taper roundly to the apex. It is allied to *C. superbum*, Casteln., from which it differs by its more convex head, more strongly acclivous above eyes; prothorax more strongly rounded on the anterior part of the sides, the anterior angles more marked and less

obtuse, sinuosity on each side of basal lobe stronger; elytra more convex, narrower at the base, more roundly ampliate behind the shoulders, lateral declivities more rounded—almost hiding the border in the middle when viewed from above. From *C. sapphirinum*, Bates, it differs by facies; the labrum smaller and more deeply emarginate; clypeus more deeply and evenly emarginate; anterior margin of head, outwards from intermediate angles of clypeus, forming an even oblique curve (not curving decidedly forward in middle as in *C. sapphirinum*). The mandibles are flat on the upper surface as in *C. superbum*.

Genus MONOCENTRUM.

MONOCENTRUM LONGICEPS, Chaud.

I have found a species of *Monocentrum* in New South Wales, near Grenfell and Urana, which seems to be *M. longiceps*, Chaud. The late Mr. Geo. Barnard found *M. longiceps* at Coomooboolaroo, Dawson River, Queensland.